

## PATENT ABSTRACTS OF JAPAN

(11)Publication number: 05-015515

(43)Date of publication of application: 26.01.1993

(51)Int.Cl.

A61B 5/07

A61B 1/04

A61B 10/00

(21)Application number: 03-047741

(71)Applicant: NISSIN ELECTRIC CO LTD

(22)Date of filing: 19.02.1991

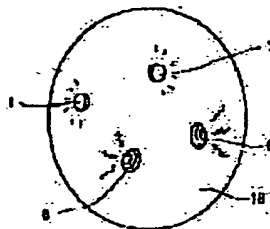
(72)Inventor: DOI AKIRA

## (54) DIGESTIVE ORGAN SYSTEM DIAGNOSING APPARATUS

## (57)Abstract

PURPOSE: To diagnose an internal wall of a digestive organ system quickly, inexpensively and at a high accuracy with no pain.

CONSTITUTION: This apparatus is provided with a superminiature LED lamp 1 which flows into a digestive organ system to irradiate inside the system, a superminiature CCD camera 6 which flows into the system and photographs the inside of the system irradiated with a lamp 1 to output an image signal and a monitor TV 14 which receives an image signal to project.



## LEGAL STATUS

[Date of request for examination]

12.12.1994

[Date of sending the examiner's decision of rejection]

[Kind of final disposal of application other than the examiner's decision of rejection or application converted registration]

[Date of final disposal for application]

[Patent number]

2768029

[Date of registration]

10.04.1998

[Number of appeal against examiner's decision of rejection]

[Date of requesting appeal against examiner's decision of rejection]

[Date of extinction of right]

Copyright (C); 1998,2003 Japan Patent Office

BEST AVAILABLE COPY

• TICES •

Japan Patent Office is not responsible for any damages caused by the use of this translation.

1. This document has been translated by computer. So the translation may not reflect the original precisely.
2. \*\*\*\* shows the word which can not be translated.
3. In the drawings, any words are not translated.

---

#### CLAIMS

[Claim(s)]

[Claim 1] Digestive system diagnostic equipment equipped with the micro CCD camera which picturizes the inside of the micro LED lamp which flows in a digestive system and irradiates the inside of said network, and said network which it flowed in said network and was irradiated with said lamp, and outputs a picture signal, and the monitor TV which receives and projects said picture signal.

---

[Translation done.]

## NOTICES

Japan Patent Office is not responsible for any damages caused by the use of this translation.

1. This document has been translated by computer. So the translation may not reflect the original precisely.
2. \*\*\*\* shows the word which can not be translated.
3. In the drawings, any words are not translated.

## DETAILED DESCRIPTION

## [Detailed Description of the Invention]

[0001] [Industrial Application] This invention relates to the digestive system diagnostic equipment which diagnoses the body or the wall condition of the digestive system of other animals.

[0002] [Description of the Prior Art] Conventionally, inspection of the esophagus and the stomach by the radiopacity after the periodic medical examination of a digestive system etc. drinks barium etc., diagnosis of the pancreas and the kidney by the supersonic wave, large intestine inspection by palpation, etc. are conducted.

[0003] And when abnormalities are found in a periodic medical examination, gastrocamera or a large intestine medical checkup camera is inserted, and still more detailed inspection is conducted.

[0004] [Problem(s) to be Solved by the Invention] Cost is high, discovery of the initial abnormalities which should be discovered at an early stage is difficult, the conventional periodic medical examination etc. requires an advanced medical checkup technique, and gastrocamera inspection has (there is displeasure which moreover drinks foreign matters, such as barium, and ) the trouble of being accompanied by still much more pain, with the pain by the palpation at the time of a large intestine medical checkup.

[0005] This invention aims at offering aponia, quickness, and the digestive system diagnostic equipment that can be diagnosed cheaply and with high precision with careful attention to the aforementioned point.

[0006] [Means for Solving the Problem] It has the monitor TV which receives the micro CCD camera which picturizes the inside of the micro LED lamp which the digestive system diagnostic equipment of this invention flows in a digestive system, and radiates the inside of the network, and the network which it flowed in the network and was irradiated with the lamp, and outputs a picture signal, and a picture signal in order to solve said technical problem, and projects.

[0007] [Function] A camera picturizes the wall of the digestive system irradiated with the lamp, a monitor TV projects the picture signal, and the sequential diagnosis of the digestive system is carried out as the lamp and camera move the digestive system diagnostic equipment of this invention constituted as mentioned above with an esophagus, the stomach, and intestines by drinking a micro LED lamp and a micro CCD camera.

[0008] [Example] One example is explained with reference to a drawing. It is transparent resin which the power supply section which consists of combination of dc-batteries, such as a micro capacitor for stationary energy storage or a film dc-battery with which the LED light emitting device (light emitting diode component) section from which 1 constitutes the micro LED lamp of the magnitude of tablet extent, and 2 constitutes a lamp 1, and 3 were prepared behind the component section 2, or said capacitor and dc-battery, and 4 cover the receiving-circuit section, and 5 covers the component section 2, a power supply section 3, and the receiving-circuit section 4, and penetrates an electric wave and CCD induction light.

[0009] The CCD component (charge-coupled device) section from which 6 constitutes the micro CCD camera of the magnitude of tablet extent, and 7 constitutes a camera 6, the lens with which 8 was prepared in the anterior part of the CCD component section 7, and 9 are the reception-and-transmission circuit sections prepared behind the CCD component section 7 through the power supply section 3, and a lens 8, the CCD component section 7, a power supply section 3, and the reception-and-transmission circuit section 9 are covered with transparent resin 5 like the lamp 1.

[0010] The body and 11 are the oscillators for electric power supplies with which the stomach and 12 were prepared in intestines and 13 was prepared in the outside of the body, and 10 supplies power to the lamp 1 in the organ of the body 10, and the power supply section 3 of a camera 6.

[0011] 14 is a monitor TV, receives the picture signal from the camera 6 in the living body with an antenna 15, and projects it to a monitor TV 14 through the amplifying-circuit section 16. 17 is inspectors, such as a medical practitioner who diagnoses with a monitor TV 14.

[0012] On the occasion of a diagnosis, with the transparent body 18 which is gelatinous as for an agar, a liquid, for example, main \*\*, with high viscosity, etc., and penetrates the electric wave for reception and transmission, and CCD induction light within an organ Drink two or more micro LED lamps 1 and micro CCD cameras 6, and power is supplied to the lamp 1 in the living body and the power supply section 3 of a camera 6 through the receiving-circuit section 4 and the reception-and-transmission circuit section 9 from the oscillator 13 for electric power supplies. The wall of a digestive system is irradiated by the LED light emitting device 2 of a lamp 1, it picturizes by the CCD component section 7 of a camera 6, and a picture signal is sent from the reception-and-transmission circuit section 9. This condition is drawing 1.

[0013] An antenna 15 receives the picture signal, it projects to a monitor TV 14 through the amplifying-circuit section 16, and an inspector 17 diagnoses. In this case, a picture signal is recorded on coincidence at VTR and CD-ROM.

[0014] A lamp 1 and a camera 6 carry out sequential observation of the stomach 11 and the intestines 12, finally observation

rectum and the anus is finished, and these foreign matters are emitted to the outside of the body with a body 18.

5] [Effect of the Invention] Since this invention is constituted as explained above, the effectiveness indicated below is done so. Without being based on barium or gastrocamera like before by flowing the micro LED lamp 1 and micro CCD camera 6 in a digestive system, picturizing the wall of the digestive system irradiated with the lamp 1 with a camera 6, and projecting the picture signal to a monitor TV 14, the wall of a digestive system can be diagnosed with a quickly sufficient precision by aponia, and moreover, it is cheap and can diagnose at an early stage.

---

[Translation done.]

TICES \*

Japan Patent Office is not responsible for any damages caused by the use of this translation.

1. This document has been translated by computer. So the translation may not reflect the original precisely.
2. \*\*\*\* shows the word which can not be translated.
3. In the drawings, any words are not translated.

---

#### TECHNICAL FIELD

[Industrial Application] This invention relates to the digestive system diagnostic equipment which diagnoses the body or the wall condition of the digestive system of other animals.

---

[Translation done.]

TICES\*

Japan Patent Office is not responsible for any damages caused by the use of this translation.

1. This document has been translated by computer. So the translation may not reflect the original precisely.
2. \*\*\* shows the word which can not be translated.
3. In the drawings, any words are not translated.

---

#### PRIOR ART

[Description of the Prior Art] Conventionally, inspection of the esophagus and the stomach by the radioparency after the periodic medical examination of a digestive system etc. drinks barium etc., diagnosis of the pancreas and the kidney by the supersonic wave, large intestine inspection by palpation, etc. are conducted.  
[0003] And when abnormalities are found in a periodic medical examination, gastroscope or a large intestine medical checkup camera is inserted, and still more detailed inspection is conducted.

---

[Translation done.]

TICES\*

Japan Patent Office is not responsible for any damages caused by the use of this translation.

1. This document has been translated by computer. So the translation may not reflect the original precisely.
- 2.\*\*\* shows the word which can not be translated.
3. In the drawings, any words are not translated.

---

#### EFFECT OF THE INVENTION

[Effect of the invention] Since this invention is constituted as explained above, the effectiveness indicated below is done so. Without being based on barium or gastrocamera like before by flowing the micro LED lamp 1 and micro CCD camera 6 in a digestive system, picturizing the wall of the digestive system irradiated with the lamp 1 with a camera 6, and projecting the picture signal to a monitor TV 14, the wall of a digestive system can be diagnosed with a quickly sufficient precision by aponia, and moreover, it is cheap and can diagnose at an early stage.

---

[Translation done.]

NOTICES

Japan Patent Office is not responsible for any damages caused by the use of this translation.

1. This document has been translated by computer. So the translation may not reflect the original precisely.
2. \*\*\*\* shows the word which can not be translated.
3. In the drawings, any words are not translated.

---

TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention] Cost is high, discovery of the initial abnormalities which should be discovered at an early stage is difficult, the conventional periodic medical examination etc. requires an advanced medical checkup technique, and gastrocamera inspection has [ there is displeasure which moreover drinks foreign matters, such as barium, and ] the trouble of being accompanied by still much more pain, with the pain by the palpation at the time of a large intestine medical checkup.

[0005] This invention aims at offering aponia, quickness, and the digestive system diagnostic equipment that can be diagnosed cheaply and with high precision with careful attention to the aforementioned point.

---

[Translation done.]



NOTICES

Japan Patent Office is not responsible for any damages caused by the use of this translation.

1. This document has been translated by computer. So the translation may not reflect the original precisely.
2. \*\*\*\* shows the word which can not be translated.
3. In the drawings, any words are not translated.

---

MEANS

[Means for Solving the Problem] It has the monitor TV which receives the micro CCD camera which picturizes the inside of the micro LED lamp which the digestive system diagnostic equipment of this invention flows in a digestive system, and irradiates the inside of the network, and the network which it flowed in the network and was irradiated with the lamp, and outputs a picture signal, and a picture signal in order to solve said technical problem, and projects.

---

[Translation done.]

NOTICES •

Japan Patent Office is not responsible for any damages caused by the use of this translation.

1. This document has been translated by computer. So the translation may not reflect the original precisely.
2. \*\*\*\* shows the word which can not be translated.
3. In the drawings, any words are not translated.

---

OPERATION

[Function] A camera pictures the wall of the digestive system irradiated with the lamp, a monitor TV projects the picture signal, and the sequential diagnosis of the digestive system is carried out as the lamp and camera move the digestive system. Diagnostic equipment of this invention constituted as mentioned above with an esophagus, the stomach, and intestines by drinking a micro LED lamp and a micro CCD camera.

---

[Translation done.]

## \*NOTICES\*

Japan Patent Office is not responsible for any damages caused by the use of this translation.

1. This document has been translated by computer. So the translation may not reflect the original precisely.
2. \*\*\*\* shows the word which can not be translated.
3. In the drawings, any words are not translated.

## EXAMPLE

[Example] One example is explained with reference to a drawing. It is transparent resin which the power supply section which consists of combination of dc-batteries, such as a micro capacitor for stationary energy storage or a film dc-battery with which the LED light emitting device (light emitting diode component) section from which 1 constitutes the micro LED lamp of the magnitude of tablet extent, and 2 constitutes a lamp 1, and 3 were prepared behind the component section 2, or said capacitor and dc-battery, and 4 cover the receiving-circuit section, and 5 covers the component section 2, a power supply section 3, and the receiving-circuit section 4, and penetrates an electric wave and CCD induction light.

[0009] The CCD component (charge-coupled device) section from which 6 constitutes the micro CCD camera of the magnitude of tablet extent, and 7 constitutes a camera 6, the lens with which 8 was prepared in the anterior part of the CCD component section 7, and 9 are the reception-and-transmission circuit sections prepared behind the CCD component section 7 through the power supply section 3, and a lens 8, the CCD component section 7, a power supply section 3, and the reception-and-transmission circuit section 9 are covered with transparent resin 5 like the lamp 1.

[0010] The body and 11 are the oscillators for electric power supplies with which the stomach and 12 were prepared in intestines and 13 was prepared in the outside of the body, and 10 supplies power to the lamp 1 in the organ of the body 10, and the power supply section 3 of a camera 6.

[0011] 14 is a monitor TV, receives the picture signal from the camera 6 in the living body with an antenna 15, and projects it to a monitor TV 14 through the amplifying-circuit section 16. 17 is inspectors, such as a medical practitioner who diagnoses with a monitor TV 14.

[0012] On the occasion of a diagnosis, with the transparent body 18 which is gelatinous as for an agar, a liquid, for example, main \*\*, with high viscosity, etc., and penetrates the electric wave for reception and transmission, and CCD induction light within an organ. Drink two or more micro LED lamps 1 and micro CCD cameras 6, and power is supplied to the lamp 1 in the living body and the power supply section 3 of a camera 6 through the receiving-circuit section 4 and the reception-and-transmission circuit section 9 from the oscillator 13 for electric power supplies. The wall of a digestive system is irradiated by LED light emitting device 2 of a lamp 1, it pictures by the CCD component section 7 of a camera 6, and a picture signal sent from the reception-and-transmission circuit section 9. This condition is drawing 1.

[0013] An antenna 15 receives the picture signal, it projects to a monitor TV 14 through the amplifying-circuit section 16, and an inspector 17 diagnoses. In this case, a picture signal is recorded on coincidence at VTR and CD-ROM.

[0014] A lamp 1 and a camera 6 carry out sequential observation of the stomach 11 and the intestines 12, finally observation of the rectum and the anus is finished, and these foreign matters are emitted to the outside of the body with a body 18.

[Translation done.]

NOTICES \*

Japan Patent Office is not responsible for any damages caused by the use of this translation.

1. This document has been translated by computer. So the translation may not reflect the original precisely.
2. \*\*\* shows the word which can not be translated.
3. In the drawings, any words are not translated.

---

#### DESCRIPTION OF DRAWINGS

---

[Brief Description of the Drawings]

[Drawing 1] It is the diagnostic-state Fig. of one example of the digestive system diagnostic equipment of this invention.

[Drawing 2] It is the perspective view of the micro LED lamp of drawing 1.

[Drawing 3] It is the perspective view of the subminiature camera of drawing 1.

[Drawing 4] It is the general drawing of this invention.

[Description of Notations]

1 Micro LED Lamp

6 Subminiature Camera

14 Monitor TV

---

[Translation done.]

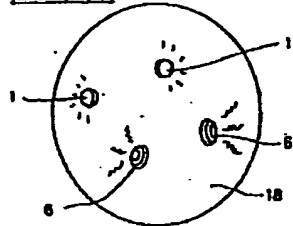
NOTICES \*

Japan Patent Office is not responsible for any damages caused by the use of this translation.

1. This document has been translated by computer. So the translation may not reflect the original precisely.
2. \*\*\*\* shows the word which can not be translated.
3. In the drawings, any words are not translated.

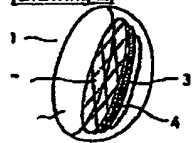
DRAWINGS

[Drawing 1]



- 1 照像LEDランプ
- 6 照像カメラ
- 14 モニタテレビ

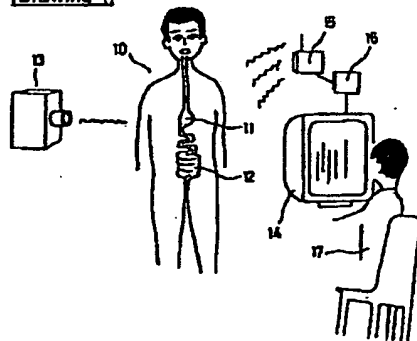
[Drawing 2]



[Drawing 3]



[Drawing 4]



[Translation done.]

**This Page is Inserted by IFW Indexing and Scanning  
Operations and is not part of the Official Record**

**BEST AVAILABLE IMAGES**

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images include but are not limited to the items checked:

- ☐ BLACK BORDERS
- ☐ IMAGE CUT OFF AT TOP, BOTTOM OR SIDES
- ☐ FADED TEXT OR DRAWING
- ☐ BLURRED OR ILLEGIBLE TEXT OR DRAWING
- ☐ SKEWED/SLANTED IMAGES
- ☐ COLOR OR BLACK AND WHITE PHOTOGRAPHS
- ☐ GRAY SCALE DOCUMENTS
- ☒ LINES OR MARKS ON ORIGINAL DOCUMENT
- ☐ REFERENCE(S) OR EXHIBIT(S) SUBMITTED ARE POOR QUALITY
- ☐ OTHER: \_\_\_\_\_

**IMAGES ARE BEST AVAILABLE COPY.**

**As rescanning these documents will not correct the image problems checked, please do not report these problems to the IFW Image Problem Mailbox.**